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Received

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DATE: April 7, 1980

SUBJECT: Data Set EDO 486, Chemical Recovery Systems, Inc.

FROM: Curtis Ross, Chief
Central Regional Laboratory

CR

TO: Sandra S. Gardebring, Director
Enforcement Division

As requested, I am forwarding the attached report which details the organic analysis of the five samples contained within the subject data set.

Any questions regarding this report should be directed to Dr. Emilio Sturino at 353-8370

Attach.

cc: Eastern District Office

Feb. 5, 1980 Sampling done

Analytical Results of
Data Set EDO 486
Chemical Recovery Systems, Inc.
April 4, 1980

By

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U. S. Environmental Protection Agency
Region V
Central Regional Laboratory
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Objective

The following five samples were collected from Chemical Recovery Systems, Inc., Elyria, Ohio by Dan Watson, Eastern District Office, on February 5, 1980.

These samples were analyzed quantitatively by GC/MS for all identifiable organic compounds present at analytically significant concentrations.

<u>Sample Number</u>	<u>Description</u>
80EW03S01	Solvent from drum in distilling area
80EW03S02	Spilled liquid near distilling area
80EW03S03	Soil from spill in back of lot
80EW03S04	Soil near still door in back of lot
80EW03S05	Soil from a run off area

Results

Table 1 shows the broad spectrum of organic compounds such as alkyl benzenes, alkyl naphthalenes, ketones, alcohols, esters and hydrocarbons detected in the samples. Particularly Samples 80EW03S01 and 80EW03S02 were heavily contaminated with toluene, xylenes, and trimethylbenzenes. Concentrations of these compounds ranged from 1300 to 50,000* ppm. In Sample 80EW03S03, 50 ppm of two trichloroaromatic compounds were detected however specific names of the compounds were not identified.

In PCB's analysis only Sample 80EW03S04 contained a significant amount of Aroclor 1242 (590 ppm).

*The toluene peak was saturated therefore the concentration of this compound should be over 50,000 ppm.

Methodology

The organic solvent Sample 80EW03S01 was analyzed by diluting 10 ml of sample to a final volume of 80 ml using methylene chloride and then analyzed by the GC/MS.

Sample 80EW03S02 had two layers. Sodium Sulfate was used to remove water from the sample. After which a 3 ml aliquot was extracted with methylene chloride-hexane. This extract was concentrated over a steam bath and analyzed using GC/MS.

Sediment samples were allowed to dry overnight at room temperature. The following day, a known amount of these samples were extracted continuously for 16 hours with a 50/50 acetone/hexane solution. The extracts were concentrated

Methodology (continued)

over a steam bath using a Kuderna-Danish concentrator. Clean-up was performed using 20 grams of florisil rinsed with hexane and ether. The samples were eluted through the column with 200 ml of 6% ether in hexane. The solutions were concentrated over a steam bath and analyzed by a GC/MS.

Quality Control

For quality control purposes, a laboratory blank and a laboratory control spike were analyzed along with the actual samples to check the method performance. None of the compounds found in the samples were detected in the laboratory reagent blank. Acceptable results were obtained for the laboratory control spike.

Instrumental Conditions

Instrument: Finnigan 1015D GC/MS

Mass Range: 40-500 amu

Integration Time: 4 m sec

Threshold: 4

Electron Energy: 70 ev

Column: 25 m x 0.2 mm SP-2100 Fused silica capillary

Linear Velocity: 25 cm/sec

Carrier Gas: Helium

Temperature Program: $T_1 = 50^{\circ}\text{C}$

$T_2 = 250^{\circ}\text{C}$

Time at $T_1 = 3.5$ min

Time at $T_2 = 10$ min

Rate = 4°C/min

Conclusion

Sample 80EWS03S01 was contaminated heavily with toluene (50,000* ppm) . xylenes (20,000* ppm). Sample 80EW03S02 was also contaminated with same matrices but much less extent than Sample 80EW03S01. In this sample the amount detected for toluene and xylenes were 7800 ppm and 3300 ppm respectively.

The total contamination of alkylbenzenes for Samples 80EW03S01 and 80EW03S02 was 73,693* ppm and 27,976 ppm respectively.

The three soil samples did not exhibit any significant contamination by these compounds however Sample 80EW03S03 contained 730 ppm of tetrachloroethane and 50 ppm of trichloro aromatic compounds. Sample 80EW03S04 contained 590 ppm of Aroclor 1242.

*The toluene and xylene peaks were saturated therefore the concentration of these compounds should be higher than indicated here also for the total amount of alkyl benzene.

Participants

Yvonne Flynn, Chemist

Ray Liu, Ph.D., Chemist

Author of this Report

Sukwha Kim, Ph.D.

Table 1
Data Set EDO 486 - Chemical Recovery Systems, Inc., Elyria, Ohio

COMPOUNDS DETECTED	SAMPLE NUMBER AND CONCENTRATION (ppm)				
	80EW03 S01	80EW03 S02	80EW03 S03	80EW03 S04	80EW03 S05
toluene	50,000*	7800	54	120	28
ethylbenzene	1300	2300	9.1	50	K0.1
xylene (3 isomers)	20,000*	3300	60	270	28
methylethylbenzene (3 isomers)	410	5100	7.3	45	K0.1
propylbenzene	330	45	K0.1	K0.4	K0.1
dimethylbenzene	1300	6000	10	110	5.0
propenylbenzene	27	120	K0.1	K0.4	K0.1
ethyldimethylbenzene (5 isomers)	130	800	14	130	K0.1
butylbenzene (2 isomers)	73	620	K0.1	K0.4	K0.1
tetramethylbenzene (3 isomers)	42	1400	12	56	2.9
methylpropylbenzene	K1.0	210	K0.1	K0.4	K0.1
ethenyldimethylbenzene	4.9	84	K0.1	9.4	K0.1
diethylbenzene	7.3	140	K0.1	K0.4	K0.1
trimethylethylbenzene	3.0	57	5.8	41	K0.1
naphthalene	7.1	520	48	150	8.7

* These peaks were saturated.

Table 1
Data Set EDO 486 - Chemical Recovery Systems, Inc., Elyria, Ohio

COMPOUNDS DETECTED	SAMPLE NUMBER AND CONCENTRATION (ppm)				
	80EW03 S01	80EW03 S02	80EW03 S03	80EW03 S04	80EW03 S05
methylnaphthalene (2 isomers)	3.9	130	34	92	14
dimethylnaphthalene (3 isomers)	K1.0	38	K0.1	110	15
ethylnaphthalene	K1.0	K3.0	K0.1	20	K0.1
trimethylnaphthalene	K1.0	K3.0	3.1	44	3.0
4-methyl-2-pentanone	490	1800	K0.1	320	7.0
5-methylhexanone	K1.0	K3.0	18	K0.4	K0.1
3,5,5-trimethyl-2-cyclohexen-1-one	8.1	95	41	290	K0.1
1-(4-methoxyphenyl)-1-propanone	K1.0	K3.0	7.1	K0.4	K0.1
octane	160	40	K0.1	K0.4	K0.1
tetrachloroethene**	K1.0	77	730	19	19
hexachloroethane **	K1.0	K3.0	6.5	5.7	K0.1
4-hydroxy-4-methyl-2-pentane	K1.0	K3.0	870	K0.4	280
4,4-dimethyl-2-pentene	K1.0	K3.0	K0.1	42	K0.1
ethylcyclohexane	20	K3.0	K0.1	K0.4	K0.1
3-methyl-3-ethylhexane	150	280	K0.1	K0.4	K0.1
butoxyethanol	K1.0	K3.0	440	230	16

**Quantitated against the response of a hexachloroethane standard and the rest of the compounds were quantitated to the response of a naphthalene standard.

Table 1
Data Set EDO 486 - Chemical Recovery Systems, Inc., Elyria, Ohio

ENDS DETECTED		SAMPLE NUMBER AND CONCENTRATION (ppm)				
		80EW03 S01	80EW03 S02	80EW03 S03	80EW03 S04	80EW03 S05
Diphenyl-2-ol		K1.0	K3.0	K0.1	46	K0.1
phenylmethylphenol		K1.0	K3.0	K0.1	4.5	K0.1
2,6-bis(1,1-dimethylethyl-4-methylphenol		K1.0	K3.0	6.3	K0.4	K0.1
2-ethoxy-ethanol acetate		170	K3.0	39	K0.4	K0.1
4- [[trimethylsilyl)-oxy]-benzoic acid, methylester		K1.0	K3.0	K0.1	44	16
methylethylcyclohexane		K1.0	38	K0.1	K0.4	K0.1
trichloro-aromatic compound(2)		K1.0	K3.0	50	K0.4	K0.1
Aroclor 1242		K1.0	K3.0	K0.1	590	K0.1
Hydrocarbons	No. of compounds	2	3	17	12	10
	Concentration	K1.0	307	170	640	72

ATTACHMENT C

**AUGUST AND SEPTEMBER 1981 HYDROGEOLOGICAL AND EXTENT OF
CONTAMINATION STUDY GROUNDWATER, SOIL, SEDIMENT, AND SURFACE WATER
SAMPLING LOCATIONS AND ANALYTICAL RESULTS**

**CHEMICAL RECOVERY SYSTEMS, INC.
ELYRIA, LORAIN COUNTY, OHIO**

(13 Pages)

Table 1. Organic analyses of soils on 8/4/81 and 8/5/81, in ppm.

Compounds	Depth	Boring# / Sample #					
		5-1	5-2	5-3	6-1	6-2	6-3
		0-1.5'	2.5-4'	5-6.5'	0-1.5'	2.5-4'	5-6.5'
Methylene Chloride		<1	1.0	<1	<1	<1	ND
Chloroform		ND	ND	ND	ND	ND	ND
1,1,1 Trichloroethane		3.7	ND	ND	ND	ND	ND
1,2 Transdichloroethylene		<1	1.6	ND	ND	ND	ND
Trichloroethylene		1.7	1	ND	ND	ND	<1
Tetrachloroethylene		26	1.4	5.1	ND	ND	ND
Benzene		ND	ND	ND	ND	ND	ND
Toluene		ND	<1	ND	ND	ND	ND
Ethyl Benzene		ND	ND	ND	ND	ND	ND
PCB (Total)		ND	ND	ND	3.3	0.68	0.48
PCB 1254		ND	ND	ND	ND	ND	ND
Napthalene		19	ND	<10	ND	ND	ND
Fluoranthene		ND	ND	ND	ND	ND	ND
3,4 Benzo(a)fluoranthene		ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene		ND	ND	ND	ND	ND	ND
Anthracene		ND	ND	ND	ND	ND	ND
Benzo(ghi)Perylene		ND	ND	ND	ND	ND	ND
Phenanthrene		ND	ND	ND	ND	ND	ND
Pyrene		ND	ND	ND	ND	ND	ND
Benzo(a)Anthracene		ND	ND	ND	ND	ND	ND
Benzo(a)Pyrene		ND	ND	ND	ND	ND	ND
Chrysene		ND	ND	ND	ND	ND	ND
Indeno(1,2,3cd)Pyrene		ND	ND	ND	ND	ND	ND

Table 1 (continued)

Compounds	Depth	Boring# / Sample #					
		6-4	7-1	7-2	7-5	8-1	8-2
		10-11.5'	0-1.5'	2.5-4'	15-16.5'	0-1.5'	2.5-4'
Methylene Chloride		<1	<1	<1	2.4	ND	ND
Chloroform		ND	ND	ND	ND	ND	ND
1,1,1 Trichloroethane		ND	ND	ND	1.0	ND	ND
1,2 Transdichloroethylene		1.9	ND	<1	13	ND	ND
Trichloroethylene		14	ND	1.1	58	ND	ND
Tetrachloroethylene		2.2	1.5	1.3	21	ND	ND
Benzene		ND	ND	ND	2.6	ND	ND
Toluene		ND	ND	<1	530	ND	ND
Ethyl Benzene		ND	ND	ND	240	ND	ND
PCB (Total)		ND	ND	ND	ND	ND	ND
PCB-1254		ND	2.5	7.6	0.08	ND	ND
Napthalene		ND	<10	<10	<10	ND	ND
Fluoranthene		ND	ND	ND	ND	ND	ND
3,4 Benzofluoranthene		ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene		ND	ND	ND	ND	ND	ND
Anthracene		ND	ND	ND	ND	ND	ND
Benzo(ghi)Perylene		ND	ND	ND	ND	ND	ND
Phenanthrene		ND	ND	ND	ND	ND	ND
Pyrene		ND	ND	ND	ND	ND	ND
Benzo(a)Anthracene		ND	ND	ND	ND	ND	ND
Benzo(a)Pyrene		ND	ND	ND	ND	ND	ND
Chrysene		ND	ND	ND	ND	ND	ND
Indeno(1,2,3cd)Pyrene		ND	ND	ND	ND	ND	ND

Table 1 (continued)

Compounds	Depth	Boring# / Sample #				
		8-3	8-4	8-5	9-1	9-2
		5-6.5'	10-11.5'	15-15.5'	0-1.5'	2.5-4'
Methylene Chloride		<1	1.1	1.13	ND	ND
Chloroform		ND	ND	ND	ND	<1
1,1,1 Trichloroethane		ND	ND	ND	ND	ND
1,2 Transdichloroethylene		ND	1.1	ND	ND	ND
Trichloroethylene		3.0	2.1	ND	ND	ND
Tetrachloroethylene		ND	ND	ND	ND	ND
Benzene		ND	<1	ND	ND	ND
Toluene		2.2	2.2	ND	ND	ND
Ethyl Benzene		1.3	ND	ND	ND	ND
PCB (Total)		ND	ND	ND	ND	ND
PCB-1254		ND	ND	ND	ND	ND
Napthalene		ND	ND	ND	ND	ND
Fluoranthene		<10	17	ND	ND	ND
3,4 Benzo(a)fluoranthene		<25	14	ND	ND	ND
Benzo(k)Fluoranthene		<10	14	ND	ND	ND
Anthracene		<10	11	ND	ND	ND
Benzo(ghi)Perylene		<25	12	ND	ND	ND
Phenanthrene		<25	11	ND	ND	ND
Pyrene		<25	24	ND	ND	ND
Benzo(a)Anthracene		ND	18	ND	ND	ND
Benzo(a)Pyrene		ND	14	ND	ND	ND
Chrysene		ND	18	ND	ND	ND
Indeno(1,2,3cd)Pyrene		ND	<25	ND	ND	ND

Table 1a. Inorganic analyses of soils on 8/4/81
and 8/5/81, in ppm

Compounds / Depth	Boring# / Sample #					
	5-1	5-2	5-3	6-1	6-2	6-3
	0-1.5'	2.5-4'	5-6.5'	0-1.5'	2.5-4'	5-6.5'
Aluminum	3400	1300	2000	3500	880	1900
Boron	14	47	ND	ND	ND	17
Barium	83	16	24	63	43	180
Chromium	3.2	ND	ND	39	ND	99
Cobalt	ND	10	14	24	14	350
Copper	300	150	14	51	14	1800
Iron	3900	2100	1900	3600	2100	4200
Manganese	300	120	140	450	340	360
Nickel	28	ND	ND	7.8	ND	42
Zinc	6100	540	990	240	50	620
Arsenic	3.3	1.5	1.5	4.7	1.6	41
Cadmium	14	ND	ND	24	6.2	680
Mercury	ND	ND	ND	ND	ND	ND
Lead	200	48	48	240	83	1100
Antimony	ND	ND	ND	3.0	15	69
Selenium	ND	ND	ND	ND	ND	1.0
Tin	2.1	3.2	3.9	ND	ND	2.2

Table 1a. continued

Compounds / Depth	Boring# / Sample #					
	6-4	7-1	7-2	7-5	8-1	8-2
	10-11.5'	0-1.5'	2.5-4'	15-16.5'	0-1.5'	2.5-4'
Aluminum	3800	3500	1000	1300	1600	1200
Boron	12	ND	12	ND	ND	ND
Barium	63	37	170	88	54	37
Chromium	3.2	88	120	130	2.7	ND
Cobalt	ND	56	34	6.5	ND	ND
Copper	14	190	120	42	18	22
Iron	2200	3700	2600	5800	5600	4400
Manganese	97	360	280	42	220	280
Nickel	ND	23	46	88	ND	ND
Zinc	550	310	320	210	67	29
Arsenic	1.3	4.4	7.2	15	1.3	1.2
Cadmium	120	33	18	7.7	1.1	2.5
Mercury	ND	ND	ND	ND	ND	ND
Lead	1600	350	860	83	95	33
Antimony	ND	11	32	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Tin	ND	ND	2.8	3.7	ND	ND

Table 1a. continued

Compounds / Depth	Boring# / Sample #				
	8-3	8-4	8-5	9-1	9-2
	5-6.5'	10-11.5'	15-16.5'	0-1.5'	2.5-4'
Aluminum	1600	3400	3400	640	400
Boron	30	20	13	ND	ND
Barium	21	38	16	77	ND
Chromium	2.7	4.5	ND	9.5	ND
Cobalt	8.1	12	ND	ND	ND
Copper	19	33	7.5	26	ND
Iron	3000	4800	5400	2400	3600
Manganese	160	190	210	750	400
Nickel	7.9	10	8.8	13	ND
Zinc	53	130	16	41	3.5
Arsenic	1.7	1.3	2.7	11	ND
Cadmium	3.3	3.1	0.34	11	ND
Mercury	0.023	0.025	ND	ND	ND
Lead	68	64	16	47	9.8
Antimony	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND
Tin	ND	ND	8.0	ND	ND

Compounds	SS-1	SS-2	SS-3	SS-4
Methylene Chloride	60	40	4800	40
Trichlorofluoromethane	ND	ND	10	10
Chloroethane	ND	ND	130	ND
1,1 Dichloroethylene	ND	ND	590	ND
1,1,1 Trichloroethane	ND	ND	1500	ND
Vinyl Chloride	ND	ND	130	ND
1,1 Dichloroethane	ND	ND	20	ND
1,2 Trans dichloroethylene	ND	ND	2100	ND
Trichloroethylene	ND	ND	530	ND
Tetrachloroethylene	ND	ND	580	ND
Benzene	ND	ND	10	ND
Toluene	ND	ND	4900	ND
Ethyl Benzene	ND	ND	4600	10
Phenol	ND	ND	340	ND
1,2 Dichlorobenzene	ND	ND	280	ND
PCB - Total	ND	ND	140	ND
Butylbenzylphthalate	ND	220	<220	ND
Di-N-Octyl Phthalate	ND	ND	220	ND
Bis(2 Ethyl Hexyl) Phthalate	ND	300	4000	1100
Naphthalene	ND	ND	640	ND
Acenaphthene	<200	ND	<200	ND
Chrysene/Benzo(a)Anthracene	4100	2100	4800	2700
Pyrene	3600	1500	2400	1200
Fluoranthene	4600	1900	3500	1400
Benzo(a)Pyrene	3400	2900	4000	1000
Benzo(k)Fluoranthene	3700	3100	4500	1200
Anthracene/Phenanthrene	3000	1500	3000	840
Fluorene	200	<200	<200	ND
Benzo(ghi)Perylene	1300	1500	3000	410
Dibenzo(a,h)Anthracene	<500	<500	680	ND
Indeno(1,2,3-cd)Pyrene	1000	1300	2300	410

	Sediment			
	SS-1	SS-2	SS-3	SS-4
Aluminum	5,600,000	1,200,000	2,700,000	2,000,000
Chromium	6,600	14,000	79,000	12,000
Barium	35,000	140,000	160,000	89,000
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	32,000	6,100
Cobalt	11,000	7,100	29,000	10,000
Copper	7,200	11,000	350,000	6,900
Iron	1,900,000	2,600,000	3,800,000	3,100,000
Lead	84,000	49,000	190,000	52,000
Nickel	11,000	22,000	400,000	32,000
Manganese	1,300,000	160,000	490,000	190,000
Zinc	81,000	50,000	480,000	67,000
Boron	ND	ND	22	ND
Vanadium	ND	ND	ND	ND
Calcium	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA
Sodium	NA	NA	NA	NA
Arsenic	4,800	ND	3,800	1,600
Antimony	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Thallium	ND	ND	1,400	ND
Mercury	ND	ND	ND	ND
Tin	ND	ND	ND	ND
Silver	3,200	ND	6,800	ND

Table 3: Organic Analyses of the H&E wells, in ppb

Compounds	Downgradient Wells				Upgradient Wells	
	Well #1		Well #2		Well #3	Well #4
	8/5/81	9/16/81	8/5/81	9/16/81	9/16/81	9/16/81
Methylene Chloride	71,000	NA	6500	ND	ND	ND
1,1 Dichloroethane	ND	NA	5300	ND	ND	ND
1,1,1 Trichloroethane	12,000	NA	2200	ND	ND	ND
Vinyl Chloride	ND	NA	ND	1000	ND	ND
1,1 Dichloroethylene	ND	NA	ND	1900	ND	ND
1,2 Trans dichloroethylene	6100	NA	10,000	1000	ND	ND
Trichloroethylene	6300	NA	ND	ND	ND	ND
Benzene	1100	NA	1900	1000	ND	ND
Toluene	100,000	NA	4500	3000	ND	ND
Ethyl Benzene	14,000	NA	ND	ND	ND	ND
Phenol	590	NA	19	ND	ND	ND
2,4 Dimethylphenol	45	NA	<10	ND	ND	ND
1,2 Dichlorobenzene	ND	NA	<10	ND	ND	ND
Pentachlorophenol	ND	NA	16	ND	ND	ND
PCB-1248	29	NA	<0.1	ND	ND	ND
PCB-1254	18	NA	<0.1	ND	ND	ND
Dimethyl Phthalate	<10	NA	ND	ND	ND	ND
Diethyl Phthalate	ND	NA	<10	ND	ND	ND
Di-N-Butyl Phthalate	<10	NA	ND	ND	ND	ND
Butyl Benzl Phthalate	27	NA	<10	ND	ND	ND
Bis(2 Ethyl Hexyl) Phthalate	27	NA	<10	ND	ND	ND
Naphthalene	130	NA	29	ND	ND	ND
Chrysene/Benzo(a)Anthracene	<10	NA	<10	ND	ND	ND
Pyrene	<10	NA	<10	ND	ND	ND
Fluoranthene	<10	NA	<10	ND	ND	ND
Benzo(a)Pyrene	<10	NA	11	ND	ND	ND
Benzo(k)Fluoranthene	<10	NA	<10	ND	ND	ND
Anthracene/Phenanthrene	<10	NA	<10	ND	ND	ND
Fluorene	<10	NA	ND	ND	ND	ND
2-Chloronaphthalene	<10	NA	ND	ND	ND	ND

Table 3a. Inorganic analyses of E&E wells, in ppb *mg/L*

Compounds	Upgradient Wells		Downgradient Wells			
	W-3	W-4	W-1		W-2	
	9/16/81	9/16/81	8/5/81	9/16/81	8/5/81	9/16/81
Aluminum	4200	3100	136,000	110,000	347,000	86,000
Chromium	490	300	1620	2500	910	790
Barium	ND	ND	164	1100	2740	1100
Beryllium	ND	ND	8	ND	14	ND
Cadmium	ND	ND	300	820	195	ND
Cobalt	ND	ND	280	ND	330	ND
Copper	ND	ND	1000	1700	1340	670
Iron	8400	4700	276,000	210,000	926,000	230,000
Lead	580	600	840	2500	1160	1100
Nickel	ND	ND	460	1000	1040	820
Manganese	13,000	4000	6560	7400	1980	14,000
Zinc	13,000	4200	4550	8600	7040	5100
Boron	NA	NA	1450	NA	740	NA
Vanadium	ND	ND	290	ND	640	ND
Calcium	NA	NA	742,000	NA	521,000	NA
Magnesium	NA	NA	125,000	NA	240,000	NA
Sodium	NA	NA	597,000	NA	250,000	NA
Arsenic	ND	ND	700	310	400	140
Antimony	ND	ND	70	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	3	ND
Tin	ND	ND	120	ND	100	ND
Silver	ND	ND	ND	ND	ND	ND

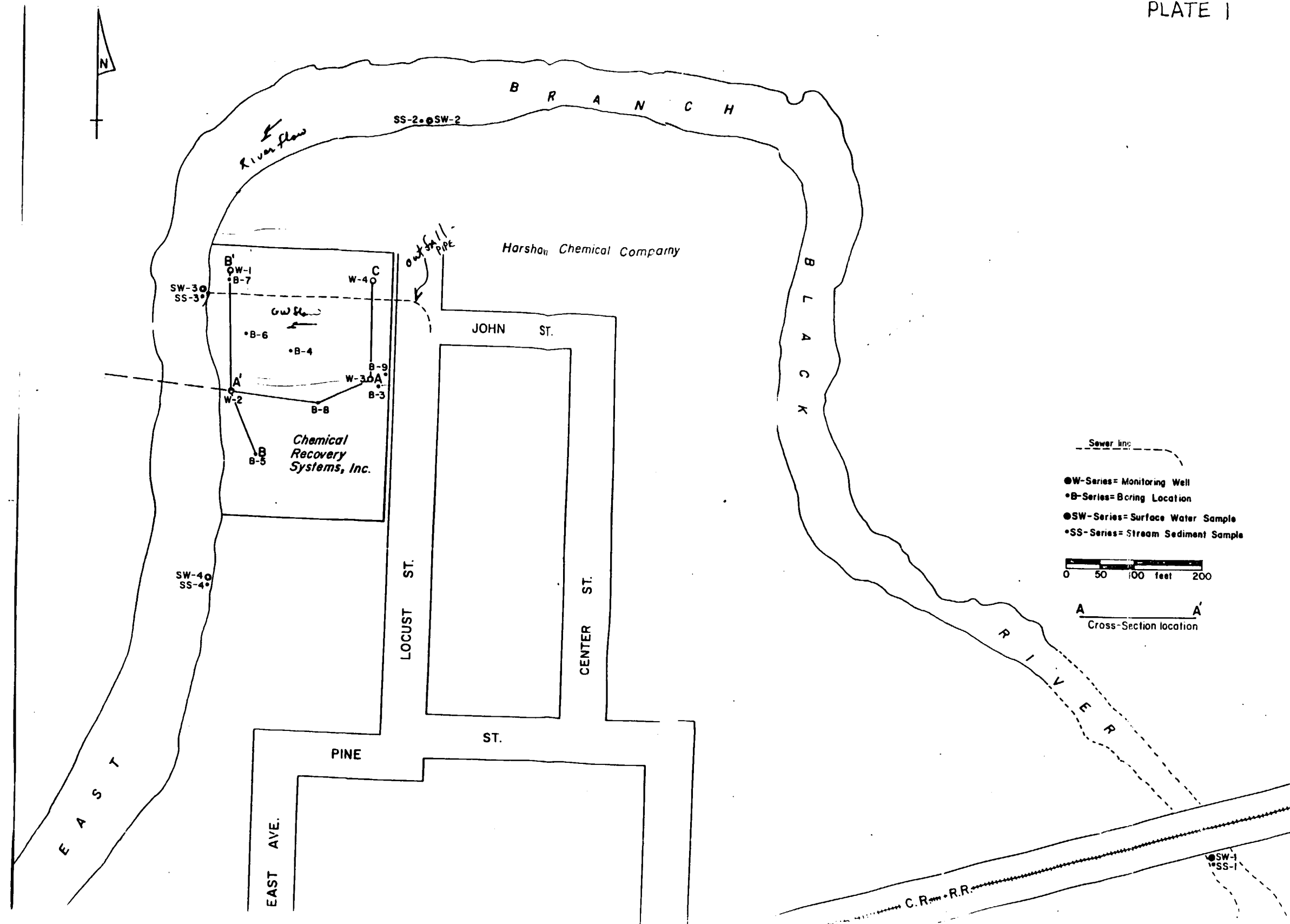
Table 4

Organic analyses of the Black River surface water,
9/16/82, in ppb

Compounds	Surface Water			
	SW-1	SW-2	SW-3	SW-4
Methyl Chloride	ND	34	ND	ND
Methylene Chloride	12	ND	8500	72
Chloroform	ND	ND	<10	ND
Carbon Tetrachloride	ND	ND	<10	ND
Dichlorobromomethane	ND	ND	<10	ND
Chloroethane	ND	ND	11	ND
1,1 Dichloroethane	ND	ND	52	ND
1,1,1 Trichloroethane	ND	ND	320	ND
Vinylchloride	ND	ND	100	ND
1,2 Transdichloroethylene	ND	ND	ND	<10
Trichloroethylene	ND	ND	1000	ND
Tetrachloroethylene	ND	ND	420	ND
Benzene	ND	ND	15	ND
Toluene	ND	ND	15	ND
1,2 Dichlorobenzene	<10	<10	140	<10
1,3 Dichlorobenzene	ND	ND	29	ND
2,4 Dichlorophenol	74	11	14	12
2,4,6 Trichlorophenol	59	ND	ND	<10
1,4 Dichlorobenzene	ND	ND	37	ND
Diethyl Phthalate	<10	<10	<10	<10
Bis(2 Ethyl Hexyl) Phthalate	18	<10	ND	ND
Naphthalene	ND	ND	<10	ND

Table 4a. Inorganic anions in the Black River and
water on 9/16/81, in ppb

Compounds	Surface Water			
	SW-1	SW-2	SW-3	SW-4
Aluminum	550	1800	200	400
Chromium	ND	ND	ND	ND
Barium	50	90	140	60
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	20	ND
Cobalt	ND	ND	ND	ND
Copper	ND	40	40	ND
Iron	900	2660	1660	620
Lead	ND	ND	ND	ND
Nickel	ND	ND	1890	20
Manganese	100	130	450	80
Zinc	ND	30	80	20
Boron	80	90	140	90
Vanadium	ND	ND	ND	ND
Calcium	67,900	68,500	86,400	70,100
Magnesium	18,200	18,100	19,100	18,700
Sodium	23,000	23,400	39,200	24,000
Arsenic	ND	ND	ND	ND
Antimony	ND	ND	20	ND
Selenium	ND	ND	10	ND
Thallium	ND	ND	50	ND
Mercury	ND	ND	ND	ND
Tin	ND	ND	ND	ND
Silver	ND	ND	ND	ND



ATTACHMENT D

FEBRUARY 5, 1986, SITE INSPECTION SURFACE WATER ANALYTICAL RESULTS

**CHEMICAL RECOVERY SYSTEMS, INC.
ELYRIA, LORAIN COUNTY, OHIO**

(Two Pages)

STATE OHIO SITE Chemical Recovery Systems TDD R05-8512-06 PAGE 2 OF 2, SET # 1

COMPOUND	SAMPLE	OTC	ITC	MEG 198	ME G195	MEG 197	MEG 196	ME E311											
	u9/L	EE 993		MEG 198	ME G195	MEG 197	MEG 196	ME E311											
	SW-2	EG 536		SW-2	EG 536	EG 538	EG 537	EG 534											
	DUP.			SW-3			BLANK	SW-1											
	u9/L			u9/L			u9/L	u9/L											
chloromethane																			
bromomethane																			
vinyl chloride																			
chloroethane																			
methylene chloride																			
acetone																			
carbon disulfide																			
1,1-dichloroethene																			
1,1-dichloroethane																			
trans-1,2,-dichloroethene																			
chloroform																			
1,2-dichloroethane																			
2-butanone																			
1,1,1-trichloroethane																			
carbon tetrachloride																			
vinyl acetate																			
bromodichloromethane																			
1,1,2,2-tetrachloroethane																			
1,2-dichloropropane																			
trans-1,3-dichloropropene																			
trichloroethene																			
dibromochloromethane																			
1,1,2-trichloroethane																			
benzene																			
cis-1,3-dichloropropene																			
2-chloroethylvinylether																			
bromoform																			
2-hexanone																			
4-methyl-2-pentanone																			
tetrachloroethene																			
toluene		3JB		4JB		2BJ	2BJ	3BJ											
chlorobenzene																			
ethylbenzene																			
styrene																			
total xylenes		3J		2J		4J													
N-nitrosodimethylamine																			
phenol																			
aniline																			
bis(2-chloroethyl)ether																			
2-chlorophenol																			
1,3-dichlorobenzene																			
1,4-dichlorobenzene																			
benzyl alcohol																			
1,2-dichlorobenzene																			
2-methylphenol																			
bis(2-chloroisopropyl)ether																			
4-methylphenol																			
N-nitroso-di-n-propylamine																			
hexachloroethane																			
nitrobenzene																			
isophrone																			
2-nitrophenol																			
2,4-dimethylphenol																			
benzoic acid																			
bis(2-chloroethoxy)methane																			
2,4-dichlorophenol																			
1,2,4-trichlorobenzene																			
naphthalene																			
4-chloroaniline																			
hexachlorobutadiene																			
4-chloro-3-methylphenol																			
2-methylnaphthalene																			
hexachlorocyclopentadiene																			
2,4,6-trichlorophenol																			
2,4,5-trichlorophenol																			
2-chloronaphthalene																			
2-nitroaniline																			
dimethyl phthalate																			
acenaphthylene																			
3-nitroaniline																			
acenaphthene																			
2,4-dinitrophenol																			
4-nitrophenol																			
dibenzofuran																			
2,4-dinitrotoluene																			
2,6-dinitrotoluene																			
diethylphthalate																			
4-chlorophenyl-phenylether																			
flourene																			
4-nitroaniline																			
4,6-dinitro-2-methylphenol																			
N-nitrosodiphenylamine																			
4-bromophenyl-phenylether																			
hexachlorobenzene																			